

CLAIMS

1. Apparatus for electrosurgically cutting about a tissue volume, comprising:  
a support member having an internal channel and extending to a forward  
region;

a tissue capture component positioned within said interior channel, having  
a leaf assembly comprising a plurality of elongate thin leafs extending forwardly from a  
base portion to a leaf tip region, a said leaf having a resilient drive component extending  
along a leaf axis from said base portion to a tip region, and an electrically insulative  
flexible leaf cable guide component having one or more guide channels deposited parallel  
with said leaf axis and extending to a guide outlet, and an integrally formed coupling  
portion mounted with said drive component, a said guide channel extending from said tip  
region along said drive component to a guide commencement location, said leaf assembly  
being moveable to deploy outwardly from said support member forward region, said  
capture component having a pursing cable assembly extending through a said cable  
guide component guide channel and said guide outlet, electrosurgically energizable and  
deployable with each said leaf tip region to define an electrosurgical cutting arc of initially  
expanding extent and subsequent pursively contracting extent;

a drive assembly engageable with said leaf assembly base portion and  
said pursing cable assembly and actuatable to move said leaf assembly to deploy  
outwardly from said support member while effecting said deployment of said pursing  
cable assembly; and

a control assembly drivably engageable with said drive assembly to effect  
said actuation thereof and having a terminal electrically coupled with said cable assembly  
to effect the electrosurgical energization thereof.

2. The apparatus of claim 1 in which:

said leaf drive component is formed of a resilient metal having a first width  
at said base portion extending at least to said guide commencement location; and

said leaf cable guide component is formed of polymeric material.

3. The apparatus of claim 2 in which:

said leaf cable guide component coupling portion is configured as a sheath  
surmounting said drive component.

4. The apparatus of claim 3 in which:

said leaf drive component first width is defined between oppositely disposed edges extending from said base portion to said guide commencement location, and is configured having a second full width less than said first width extending from said guide commencement location to said tip region and defining with said first width oppositely disposed shoulders at said guide commencement location; and

said leaf cable guide coupling portion is configured having oppositely disposed rearward end surfaces at said guide commencement location extending in abuttable support before said oppositely disposed shoulders.

5. The apparatus of claim 3 in which:

said leaf drive component is configured having at least one serrated edge with rearwardly directed points engageable with said sheath configured to engage said leaf cable guide component coupling portion when said leafs are moved rearwardly from a deployed orientation toward said support member.

6. The apparatus of claim 4 in which:

said leaf drive component first width is about 0.080 inch; and

said leaf drive component second full width is about 0.060 inch.

7. The apparatus of claim 6 in which:

each said leaf cable guide coupling portion oppositely disposed rearward end surface has a widthwise extent of about 0.010 inch.

8. The apparatus of claim 2 in which:

said leaf cable guide component has one said guide channel configured to surround one or more cables of said pursing cable assembly between said guide outlet and said guide commencement location.

9. The apparatus of claim 8 in which:

said guide channel exhibits an internal diametric extent of about 0.015 inch.

10. The apparatus of claim 2 in which:

said leaf cable guide component polymeric material is polytetrafluoroethylene.

11. The apparatus of claim 1 in which:  
said leaf cable guide component is formed of polymetric material; and  
each said guide channel is reinforced in the vicinity of said guide outlet to  
an extent effective to avoid damage occasioned during the deployment of said cable  
assembly.
12. The apparatus of claim 11 in which:  
said leaf resilient drive component is formed of metal and is configured to  
define a protective aperture extending across said guide outlet at said tip region.
13. A system for retrieving a tissue volume, comprising:  
a support assembly with an interior channel extending along an instrument  
axis to a forward region;  
a capture component positioned within said interior channel, having a leaf  
assembly comprising a plurality of thin leafs arranged in mutual adjacency for cage  
definition, extending from a base portion to a leaf tip region, a said leaf having a resilient  
drive component extending along a leaf axis from said base portion to a tip region, and an  
electrically insulative flexible leaf cable guide component having one or more guide  
channels disposed parallel with said leaf axis and extending to a guide outlet at said leaf  
tip region and an integrally formed coupling portion mounted with said drive portion, a said  
guide channel extending from said tip region guide outlet along said drive component to a  
guide commencement location, said capture component having a pursing cable assembly  
comprising electrosurgically energizable cables, each said cable extending from a cable  
terminator through a said guide channel and its associated guide outlet at one said leaf  
and thence into a said guide outlet and associated guide channel at a next adjacent said  
leaf and extending therethrough to a connection with the drive component thereof, said  
capture component base portion being drivable to extend said leafs from an initial position  
generally within said interior channel outwardly and forwardly toward an expanded  
orientation, said cables being loadable in tension to effect a pursing of said leaf tip  
regions from said expanded orientation toward said instrument axis to exhibit a capture  
orientation;  
a support assembly configured to support said cable terminator for  
slideable forward movement under drive from said cables;  
a drive assembly having a drive member drivably engaged with said  
capture component base portion and actuatable to apply said drive thereto;

a cable stop located to effect blockage of said slideable forward movement of said cable terminator at a location effecting the loading of said cables in tension; and

a control assembly controllable to effect said electrosurgical energization of said cables and actuation of said drive assembly.

14. The system of claim 13 in which:  
said cable connection with said drive member is located rearwardly of said guide commencement location.
15. The system of claim 14 in which:  
said cable connection comprises a key slot formed through said drive component; and  
an enlargement at the terminus of an associated said cable extending through and engaged by said key slot.
16. The system of claim 13 in which:  
said leaf cable guide component is formed of polymeric material; and  
each said guide channel is reinforced in the vicinity of said guide outlet to an extent effective to avoid damage occasioned during the deployment of said cable assembly.
17. The apparatus of claim 16 in which:  
said leaf resilient drive component is formed of metal and is configured to define a protective aperture extending across said guide outlet at said tip region.
18. The apparatus of claim 13 in which:  
said leaf drive component is formed of a resilient metal having a first width at said base portion extending at least to said guide commencement location; and  
said leaf cable guide component is formed of polymeric material.
19. The apparatus of claim 18 in which:  
said leaf cable guide component coupling portion is configured as a sheath surmounting said drive component.

20. The apparatus of claim 19 in which:

said leaf drive component first width is defined between oppositely disposed edges extending from said base portion to said guide commencement location, and is configured having a second full width less than said first width extending from said guide commencement location to said tip region and defining with said first width oppositely disposed shoulders at said guide commencement location; and

said leaf cable guide coupling portion is configured having oppositely disposed rearward end surfaces at said guide commencement location extending in abuttable support before said oppositely disposed shoulders.

21. The apparatus of claim 18 in which:

said leaf cable guide component polymeric material is polytetrafluoroethylene.

22. A system for retrieving a tissue volume, comprising:

a support assembly with an interior channel extending along an instrument axis to a forward region;

a capture component positioned within said interior channel, having a leaf assembly comprising a plurality of thin leafs extending forwardly from a base portion to a leaf tip region, a said leaf having a resilient drive component extending along a leaf axis from said base portion to a tip region, and an electrically insulative flexible leaf cable guide component having one or more guide channels disposed parallel with said leaf axis and extending to a guide outlet, and an integrally formed coupling portion mounted with said drive component, a said guide channel extending from said tip region along said drive component to a guide commencement location, said leaf assembly being drivable to deploy outwardly from said support member forward region, said capture component having a pursing cable assembly comprising electrosurgically energizable cables, each said cable extending from a cable terminator through a said cable guide component guide channel and guide outlet and being deployable with each leaf tip region to define an electrosurgical cutting arc of initially expanding movement and subsequent contracting movement as said leaf tip regions mutually converge toward a capture complete basket defining orientation;

a drive assembly having a drive component drivably engaged with said capture component base portion and extending to connection with a drive member, and a motor drive assembly energizable to impart forward drive movement to said drive member

to effect application of drive to said capture component and exhibiting a stall condition when said forward drive movement of said drive member is terminated;

a support assembly configured to support said cable terminator and said drive member for slideable forward movement;

a cable stop located to effect blockage of said slideable forward movement of said cable terminator to effect said arc contracting movement;

a drive member stop located to effect blockage of said slideable forward movement of said drive member in correspondence with said capture complete basket defining orientation to effect said stall condition; and

a control assembly controllable to effect said energization of said motor drive assembly and said cables, and to de-energize said cables and said motor drive assembly in response to said stall condition.

23. The system of claim 22 further comprising:

a safety stop located forwardly of said drive member stop to effect blockage of said slideable forward movement of said drive member in the event of a failure on the part of said drive member stop to do so.

24. The system of claim 23 in which:

said safety stop is located in substantially close proximity to said drive member stop.

25. The apparatus of claim 22 in which:

said leaf drive component is formed of a resilient metal having a first width at said base portion extending at least to said guide commencement location; and

said leaf cable guide component is formed of polymeric material.

26. The apparatus of claim 25 in which:

said leaf cable guide component coupling portion is configured as a sheath surmounting said drive component.

27. The apparatus of claim 26 in which:

said leaf drive component first width is defined between oppositely disposed edges extending from said base portion to said guide commencement location, and is configured having a second full width less than said first width extending from

said guide commencement location to said tip region and defining with said first width oppositely disposed shoulders at said guide commencement location; and

    said leaf cable guide coupling portion is configured having oppositely disposed rearward end surfaces at said guide commencement location extending in abuttable support before said oppositely disposed shoulders.

28. The apparatus of claim 27 in which:

    said leaf drive component is configured having at least one serrated edge with rearwardly directed points engageable with said sheath configured leaf cable guide component coupling portion when said leafs are moved rearwardly from a deployed orientation toward said support member.

29. The apparatus of claim 27 in which:

    said leaf drive component is configured having an effective width less than said second full width extending from said guide commencement location to said tip region.